

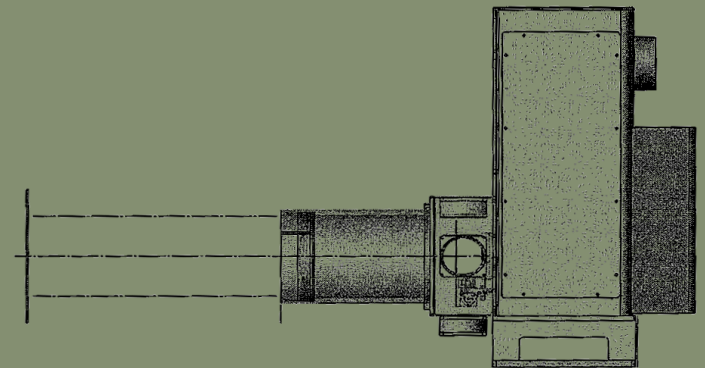
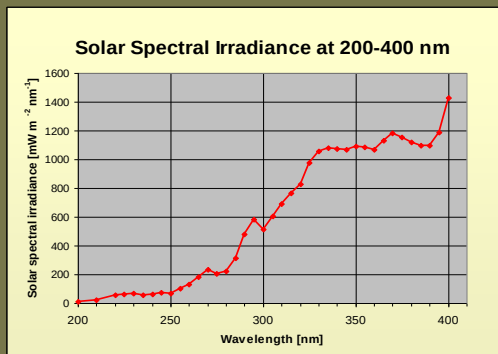


The NUV source can produce high-power NUV radiation (200-400 nm) of up to 10 equivalent suns. It can be mounted on any 6" flange or larger

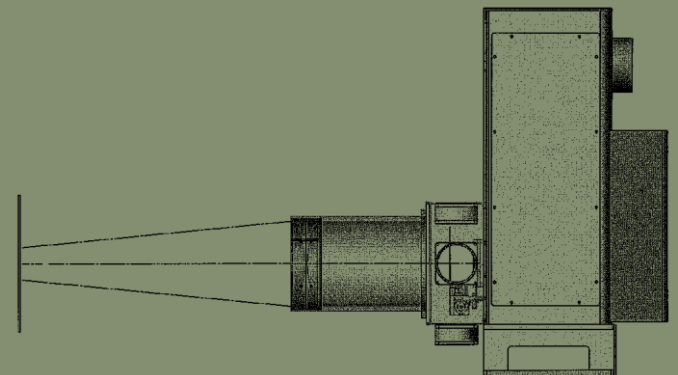
Technical Characteristics of the NUV System

The technical characteristics of the NUV system are designed to fully comply with the requirements of delivering 1-10 equivalent suns (ES) of radiation. Schematic view of the NUV system and its irradiation geometry with relation to the sample holder in the AO system is given in Figure below. In general the system will include but is not limited to the following parts:

- **Basic NUV Source** - includes a xenon and/or mercury lamp. The lamp provides continuous spectra from 180 nm to 2,500 nm of course at varying intensity;
- **Optical NUV System** - consists of 2 NUV lenses and IR filter that cuts off the deep UV below 240 nm;
- **Advanced NUV System** - combines the Basic NUV Source and Optical NUV Systems and allows to deliver NUV radiation to the samples located at 0-1 m.



Basic NUV System



Optical NUV System

Technical Parameters of the NUV System

Parameters		Basic NUV System	Advanced NUV System
Type of the NUV source		Near UV (Mercury-Xenon) lamp	
Wavelength range (nm)		180 to 2,500	180 to 400
Intensity of the Sun, air mass zero (AM0) *)	A: 315-400 nm	9.2 mW/cm ²	
	B: 280-315 nm	1.9 mW/cm ²	
	C: 200-280 nm	0.6 mW/cm ²	
Power of the NUV source (W)		5,000	
Estimated NUV spot diameter (cm)	15	10	0-25
	35	22	
	50	40	
Spectral output intensity (%)		See Fig. 2	
Estimated NUV intensity (eq. Suns) at different distance from the NUV source (cm)	15	12.0	10
	35	9.5	
	50	9.0	
Cooling system (ozone-free)		YES	YES
NUV intensity control		NO	YES
NUV spot diameter adjustment		NO	YES
NUV system computer-control		NO	YES
NUV intensity measuring system		NO	YES
NUV system holder		NO	YES

Optical System

NUV lamp	YES	YES
Ellipsoidal reflector (8")	YES	YES
Condenser quartz lens	YES	YES
Quartz flat protection window	YES	NO
Focusing system (1-2 quartz lenses)	NO	YES
Focal distance range (cm)	NO	25-45
CF port view (6")	NO	YES
IR filter	NO	YES

Geometry of the NUV System (estimated)

NUV system design	Cylindrical	
External housing diameter (cm)	25	
Length (cm)	50	80
Weight (kg)	6.5	10.2
Supply voltage (V)	120	
Supply current (A)	~50	
Supply frequency (Hz)	50-60	



Air Cooling VUV System
(UV-SimTek™ ACS-30W-01 source)

Technical Characteristics of the VUV Source

The VUV source includes:

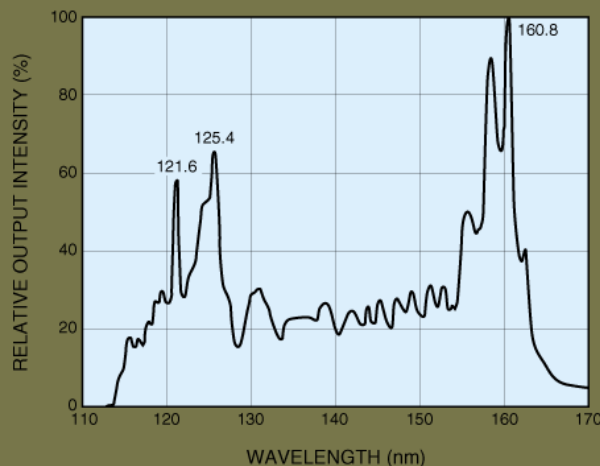
- **L2D2 deuterium lamp** with magnesium fluoride windows, providing a continuum spectral output between approximately 115 and 400 nm;
- Deuterium lamp **housing**;
- **Power supply** for deuterium lamps.

The lamp housing is designed to allow easy operation of the deuterium lamp and provide full lamp performance and replacement. It accommodates the lamp with a flange so that no optical alignment is required. The built-in forced-air cooling ensures high safety.

The front plate of the VUV source housing is an anodized aluminum disk mounted on the chamber using a 2.75" SS standard ConFlat flange. A special screw-nut pair is used for vacuum sealing of the VUV lamp using a Vinyl O-ring. The protection cylinder is made from anodized aluminum alloy in the form of a radiator and is used for screening purposes to protect the personnel from temperature, UV radiation and electrical shock.



Water Cooling VUV System
(UV-SimTek™ WCS-150W-01 source)



Technical Parameters of the VUV System

Parameters	Air Cooling System	Water Cooling System
Wavelength range (nm)	115-200	115-200
Window material	MgF ₂	MgF ₂
Aperture size (mm)	1.0	2.5
Power of the VUV source (W)	30	150
Cooling method	Air	Water
Installation to vacuum port	2.75" CF Flange	2.75" CF Flange



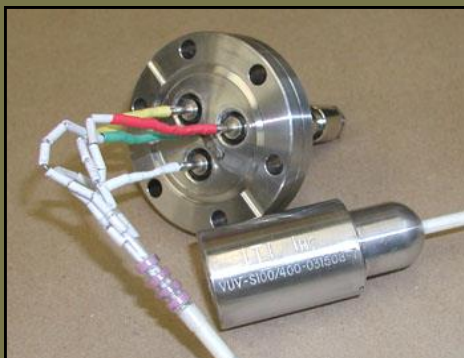
Technical Characteristics of the VUV Intensity Meter

The developed UVM-SimTek™ VUV Intensity Meter is designed for high accuracy measurements of vacuum UV intensity within 110-180 nm (impulse or analog mode).

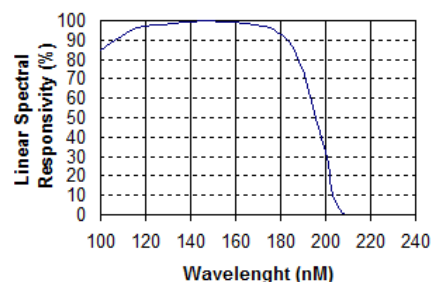
- Measurement range: 100 nW/cm² to 100 mW/cm² (Impulse mode), or 100 nJ/cm² to 12 mJ/cm² (Analog mode);
- Operating pressure range: 10⁻¹ to 10⁻⁸ Pa;
- Operating temperature range: -30°C to +280°C;
- Wavelength range of max. spectral sensitivity (S_{max}): 118-164 nm;
- Spectral sensitivity: $S = 0.1 \times S_{max}$ within 60-210 nm.

The UVM-SimTek™ VUV Intensity Meter is based on a high sensitivity VUV sensor and operated by original computer control software. The VUV sensor can be mounted on any standard or custom flange and can be installed in any vacuum chamber in the plane of the samples.

The VUV intensity detector was calibrated using a standard Vacuum UV source to allow for high accuracy VUV intensity measurements in either standard or customized units.



Linear Spectral Response of VUV Intensity monitoring Sensor



UVM-SimTek™ VUV Intensity Meter Computer Control Software

The VUV intensity measurements can be conducted using a digital meter or a computer. The UVM-SimTek™ VUV Intensity Meter control software uses the analog (for high-level signal) or pulse (for low-level signal) measurement modes. Measured UV intensity peak value is shown on a digital display and can be averaged over a given time period.

